GRIT, RETENTION AND STUDENT SUCCESS IN A SOUTH AFRICAN DISTANCE EDUCATION INSTITUTION: A POSTGRADUATE TRIAD?

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ABSTRACT

Psychological grit has gained substantial interest among traditional higher education practitioners, with many seeking the link between grit, academic performance and retention. The literature pertaining to distance education cohorts is scant, however, especially within the South African context, which holds unique challenges for accessing and completing a tertiary qualification. This study made use of a non-experimental design and used Grit-S and demographic data combined with records of student performance and progression to ascertain grit's role in determining retention and degree completion at a mega distance education institution in South Africa. The sample comprised 775 honours students who registered for their qualification for the first time in 2017. Results from the final structural model highlighted the significant influence of perseverance and first-to-second year retention on student success (operationalised at qualification completion). A subsequent binary logistic regression revealed odds ratios of 1.98 (CI: 1.45 – 2.69) and 12.15 (CI: 7.40 - 19.95), respectively. The final model explained 24% of the variance in qualification completion rates, with the biggest contributor being first-to-second year retention (β = .45; p < .01). These results and subsequent implications are discussed.

Keywords: Psychological grit, student success, retention, postgraduate, distance education, South Africa.

INTRODUCTION

Degree completion rates (or throughput rates) have remained chronically low in many South African institutions, but particularly among those embracing distance education (DE) as their primary mode of delivery. As the leader of open distance e-learning (ODeL) on the African continent with over 94% of all DE students in the country (ca. 363 000 students), the University of South Africa (UNISA) is particularly prone to this tertiary endemic (Department of Higher Education and Training, 2023b). According to the most recent throughput statistics available, the national dropout rate among DE cohorts in the first year of study ranged from as high as 56.8% in 2000 to 24.9% in 2020 (Department of Higher Education and Training, 2023a, p. 20). What's worse, the year-on-year retention rates taper off each year, with resulting throughput rates standing between 11.6% (2000 cohort) and 30.0% (2012 cohort) after 10 years (Table 1; Department of Higher Education and Training, 2023a). Despite the consistent improvement evident in first-year attrition rates, the 2020 cohort still lost a quarter of its students to dropout. This loss represents not only an inefficient use of funding in DE, but also the cost of time, energy, effort and finances to the student. Before proceeding, however, we would like to acknowledge that dropout is a multifaceted, complex concept

with varying definitions (Bagriacik Yilmaz & Karatas, 2022; Elibol & Bozkurt, 2023). In this paper, the conceptualisation of dropout used by the institution under study is one where a student registered for formal studies does not return to studies in subsequent years.

Table 1. National throughput rates for all undergraduate qualifications in distance education (Department of Higher Education and Training, 2023a, p. 21)

Intake year	Graduates (%): Distance mode							
Year 1	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
2000	3.2	5.4	7.4	8.6	9.4	10.2	11.0	11.6
2001	3.2	5.2	7.0	8.3	9.2	10.1	11.1	12.0
2002	9.0	11.0	12.7	13.9	14.9	15.9	16.8	17.6
2003	4.3	6.1	7.8	9.4	10.7	11.9	13.1	14.1
2004	4.1	6.3	8.3	10.0	11.6	12.9	14.0	15.3
2005	1.8	3.9	6.3	8.5	10.3	11.8	13.4	14.8
2006	1.9	4.2	6.6	8.7	10.5	12.2	14.0	15.4
2007	2.7	5.6	8.4	10.9	13.6	15.9	17.9	19.4
2008	1.7	4.7	7.7	11.3	14.4	16.9	18.9	20.3
2009	2.1	6.3	11.4	16.3	20.2	23.2	25.1	26.7
2010	2.3	6.8	12.8	18.5	22.6	25.4	27.3	28.8
2011	2.2	6.9	13.6	19.7	23.5	26.1	27.8	29.5
2012	1.5	5.4	13.0	19.1	23.3	25.8	28.3	30.0
2013	1.8	8.3	16.5	22.9	26.6	29.7	31.6	
2014	3.2	10.8	20.9	27.8	33.1	36.2		
2015	2.2	9.6	20.6	28.4	32.9			
2016	4.1	14.1	25.8	32.8				
2017	2.9	14.0	25.2					
2018	3.0	14.1						
2019	3.6							

Throughput Rates among Postgraduate Honours Cohorts

While a great deal has been done within the undergraduate arena, those studies which concern themselves with the success and retention of postgraduate honours students in South Africa are scant (Mouton et al., 2015). Seeking to narrow the gap almost a decade ago, Mouton et al. (2015) examined the 2001 and 2008 entering honours cohorts (N = 17 773 and N = 26 148, respectively) in South African public higher education institutions (HEIs) over a period of years. Their results revealed that 66.3% of the 2001 cohort and 65.5% of the 2008 cohort had graduated within five years, with yearly marginal increases thereafter (i.e. by less than 1% per year). Despite not being able to locate UNISA's honours students in the study by Mouton et al. (2015), the study provides useful insight into the retention and throughput of honours students in South Africa

UNISA's Honours Cohorts

Among UNISA students specifically, a report compiled by UNISA's Directorate for Institutional Research (2015) showed that the honours cohorts in the university exhibited poorer retention and graduation rates when compared to the undergraduate and other postgraduate clusters. Using aggregated data captured over

a period of ten years, analysis revealed year-on-year increases in the throughput rates for all qualification clusters with the exception of the honours cohorts (Directorate for Institutional Research, 2015). The completion rates among the honours cohorts dropped from 25.1% in 2011 to 24.8% in 2012, and then to 24.7% in 2013. Although considered a relatively small decrease, it should be noted that the data represents a 10-year trend of all entering honours cohorts. As such, the importance of these results lies in the observed trend over time, which indicates that, on average, less than a quarter of the honours cohorts at UNISA persist to the point of completion, with these figures demonstrating unfavourable trajectories for the future.

The Role Played by the Postgraduate Honours Qualification

The South African higher education (HE) system is structured according to the Higher Education Qualifications Subframework (HEQSF), which outlines National Qualifications Framework (NQF) levels that specify the outcomes of each level (Department of Higher Education and Training, 2014). The levels range from 1 (i.e. a General Education Certificate) to 10 (i.e. a doctoral degree), with honours qualifications classified at NQF level 8. At this level, honours qualifications play a crucial role in preparing students for careers that specialise in higher order, strategic and critical thinking skills. It also forms part of the pipeline into master's education. In particular …

> *…the Bachelor Honours Degree is a postgraduate specialisation qualification, characterised by the fact that it prepares students for research-based postgraduate study. This qualification typically follows a Bachelor's Degree and serves to consolidate and deepen the student's expertise in a particular discipline, and to develop research capacity in the methodology and techniques of that discipline. This qualification demands a high level of theoretical engagement and intellectual independence* (Department of Higher Education and Training, 2014, p. 34).

Despite their importance, honours cohorts have received (and continue to receive) relatively less attention from educationists and researchers compared to undergraduate cohorts (Mouton et al., 2015). With this in mind and given their importance in the South African HE value-chain as well as the size of the institution under study, it is crucial to understand what factors, if any, play a role in improving the retention and throughput rates among honours cohorts.

PSYCHOLOGICAL GRIT

Cognitive ability as a key determinant in academic success is well established, even in DE. However, there has been a recent shift in success research and positive psychology toward the examination of the role of socio-emotional skills or non-cognitive skills with an emphasis on mindset, personal traits, goal orientation and self-efficacy (Danner, Lechner & Rammstedt, 2020; Kaya & Yuksel, 2022; Mohan & Kaur, 2021). While relatively young as a field of study, psychological grit has emerged as one of the key factors in this area of research (Kaya & Yuksel, 2022).

Defined as passion and perseverance towards long-term goals (Duckworth, Peterson, Matthews & Kelly, 2007), grit has received global attention over the last 15 years and has emerged as a key factor in predicting student retention and success in tertiary settings (Akos & Kretchmar, 2017; Bowman, Miller, Woosley, Maxwell & Kolze, 2019; Datu, Valdez & King, 2016; Farruggia, Han, Watson, Moss & Bottoms, 2018; Mason, 2018; Saunders-Scott, Braley & Stennes-Spidahl, 2018). While significant strides have been made in this regard, the findings on grit often relate to traditional student populations (i.e. contact-based), or high-achieving, privileged student populations. And although studied within the confines of DE (Cross, 2014; Hwang, Lim & Ha, 2017; Wang & Baker, 2018), these studies have been conducted abroad (i.e. USA and South Korea). With this evident gap in mind, there was a need to establish how grit performs within a South African DE institution, which comprises a broad cross-section of gender, age, socio-economic status and academic ability, such as that found at UNISA.

PURPOSE OF THE STUDY

With the aforementioned gap in mind, the current paper aimed to determine the relationship(s) between psychological grit, retention from first to second year and student success (operationalised as qualification completion) among a sample of honours students in an ODeL institution in South Africa. Prompted by this aim, the following question was conceptualised: How best could the relationship between grit, retention and degree completion be described among a sample of postgraduate students in a South African DE institution?

METHOD

Using a cross-sectional design and a census sampling technique, a link to an online version of the Grit-S survey was distributed to all the first-time entering honours students at the institution in the 2017 academic year (N = 8 689; Creswell, 2012). Those who completed the online survey within the allotted timeframe constituted the sample (n = 775), resulting in an overall response rate of 8.9%. One- and five-year lagged secondary data was then obtained (in the 2018 and 2022 academic years) to ascertain the retention and qualification completion status of each participant.

Participants

Demographics

(This study did not receive permission to obtain demographic statistics on the study population. As such, demographic information on the study sample could only be gathered by including a [demographics] section in the online survey.)

As mentioned, the sample comprised 775 honours students who registered for their honours qualification for the first time in 2017. Of these 775 students, over 70% were female (n = 547) and 29.4% were male (n = 228). On average, the sample of honours students were 33 years old (SD = 8.78 years). Most students were African (58.5%; n = 453), followed by white (27.5%; n = 213), Indian (6.2%; n = 48), mixed race (6.2%; n = 48) and Asian students (0.4%; n = 3). Ten students chose not to disclose their ethnicity. Close to one-third of the participants were English-speaking (29%; n = 225), followed by Afrikaans- (14.7%; n = 114) and IsiZulu-speaking students (14.2%; n = 110). Of the 775 students in the sample, 596 students were employed (76.9%), 86 were not employed (11.1%) and 62 were full-time students (8%). Over 98% reported that they had no disabilities (n = 760); of those 15 students who indicated a disability, the most commonly cited was a mental disorder/phobia (n = 5).

Retention and Success

Of the 775 honours students who comprised the sample, 107 students (13.8%) were not retained in the subsequent academic year (i.e. 2018), and 60.8% of the sample returned for their second year (n = 471). Over 25% of the sample completed their honours degree in one year (in 2017) and were thus excluded from the retention analyses and recoded as missing data (n = 197). These frequencies are shown in Table 2. Further analysis revealed that, of the 775 students, 79.4% had completed their honours degree over a five-year period (n = 615), whereas 160 students (20.6%) had not completed (as of 2022).

Table 2. First-to-second year retention rates (2017 to 2018)

	n	%
Not retained	107	13.8%
Retained	471	60.8%
Missing	197	25.4%

Data Collection and Analysis

As briefly mentioned, data was collected using an online survey which comprised several demographic items along with the eight items in the Grit-S scale. Following the data collection process, the data was analysed using structural equation modelling (SEM), an approach used to test and evaluate multivariate causal relationships (Fan et al., 2016). The psychometric soundness of the Grit-S scale was also explored among the sample. These analyses are presented below.

The Scale

Prior to SEM, a confirmatory factor analysis (CFA) was computed using AMOS (Version 28) to test the measurement model and assess the construct validity of the Grit-S scale. As part of the CFA, factor loadings were assessed for each item; these ranged from .17 (*Setbacks don't discourage me*) to .87 (*I am diligent*). Although the factor loading for Item 2 (*Setbacks don't discourage me*) was well below suggested cut-offs (i.e. < .40; Matsunaga, 2010), the item is central to the core concept of grit, and as a result, its inclusion is necessary to avoid construct under-representation (Furr & Bacharach, 2014). Moreover, the model-fit measures that were used to assess the model's overall goodness of fit (χ^2/df, *p*-value, GFI, CFI, NFI, TLI, RMSEA, SRMR) were all within their respective common acceptance levels, despite the low loading from Q2. The two-factor model (consisting of passion and perseverance) yielded a good fit to the data; χ^2/df = 2.45, GFI = .985, CFI = .983, NFI = .972, TLI = .975, RMSEA = .04, SRMR = .03. The two-factor measurement model, along with the standardised estimates, is depicted below.

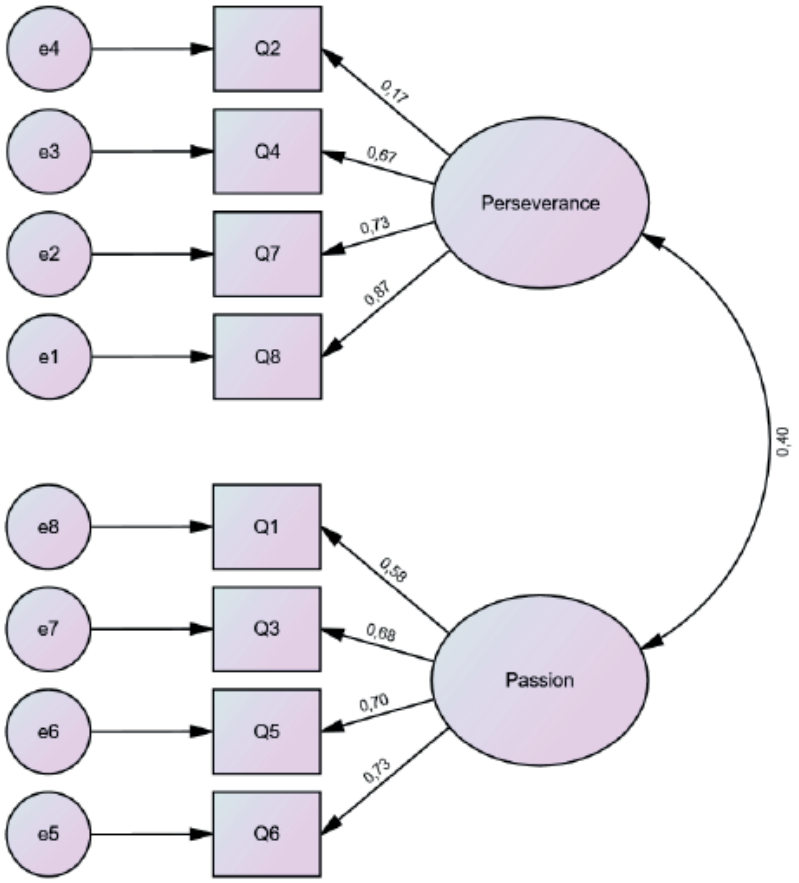

Figure 1. Two-factor measurement model of the Grit-S scale

Construct reliability was then assessed using Cronbach's alpha and composite reliability coefficients. Results revealed that both constructs, passion and perseverance, were reliable among the sample of honours students (n = 775), yielding Cronbach's alphas (α) of .62 and .77, respectively. Further evidence of construct reliability was provided by calculating composite reliability coefficients, both of which demonstrated acceptable levels of reliability (i.e. > .70). These results are shown in Table 3.

Table 3. Reliability of the Grit-S scale

Construct	Number of items	Cronbach's alpha (α)	Composite reliability (CR)
Passion	4	.768	.769
Perseverance	4/3	.618/.793*	.725

** Cronbach's alpha if 'Setbacks don't discourage me' is deleted*

Structural Equation Models

Following the CFA and reliability analyses, several structural models were built, and their fit assessed. The first SEM model aimed to ascertained grit's role (operationalised as passion and perseverance) in determining retention among the sample (prior to model fitting, missing data was removed), followed by a second model which positioned success (operationalised as qualification completion) as the dependent variable. The final model positioned success as the dependent variable, with grit and retention as the independent constructs. These models and their respective fit indices (χ^2/df, p-value, GFI, CFI, NFI, TLI, RMSEA, SRMR) are tabulated (and discussed) below.

Table 4. Model fit indices

Model	*N*	χ^2/df	p	GFI	CFI	NFI	TLI	RMSEA	SRMR
Passion, Perseverance, Retention	578	1.77	.010	.983	.983	.962	.976	.037	.036
Passion, Perseverance, Success	775	2.03	.002	.985	.984	.970	.977	.037	.032
Passion, Perseverance, Retention, Success	578	1.75	.005	.980	.981	.957	.974	.036	.043

Although the results of the first SEM (passion, perseverance, retention) revealed good fit to the data (as seen in Table 4), the path coefficients for perseverance and passion were not statistically significant (β = .05 and β=.09, respectively). The second SEM also demonstrated good fit to the data and produced a significant path between success and perseverance (β = .20; p < .01). The last model (with passion, perseverance and retention as the independent variables and success as the dependent variable) also showed good fit and exhibited two significant paths: one between perseverance and success (β = .20; p < .01), and the other between retention and success (β = .45; p < .01). The unstandardised coefficients, together with the standard errors (SE) and p-values of all three models, are tabulated below, along with a path diagram of the third model (in Figure 2).

Table 5. Unstandardised regression weights

Model	Constructs	Estimate	S.E.	C.R.	p
1	Retention <--- Perseverance	.026	.028	0.919	.358
	Retention <--- Passion	.041	.024	1.668	.095
2	Success <--- Perseverance	.111	.025	4.487	.001
	Success <--- Passion	.026	.021	1.211	.226
3	Success <--- Perseverance	.126	.029	4.375	.001
	Success <--- Passion	.004	.025	0.173	.863
	Success <--- Retention	.514	.042	12.357	.001

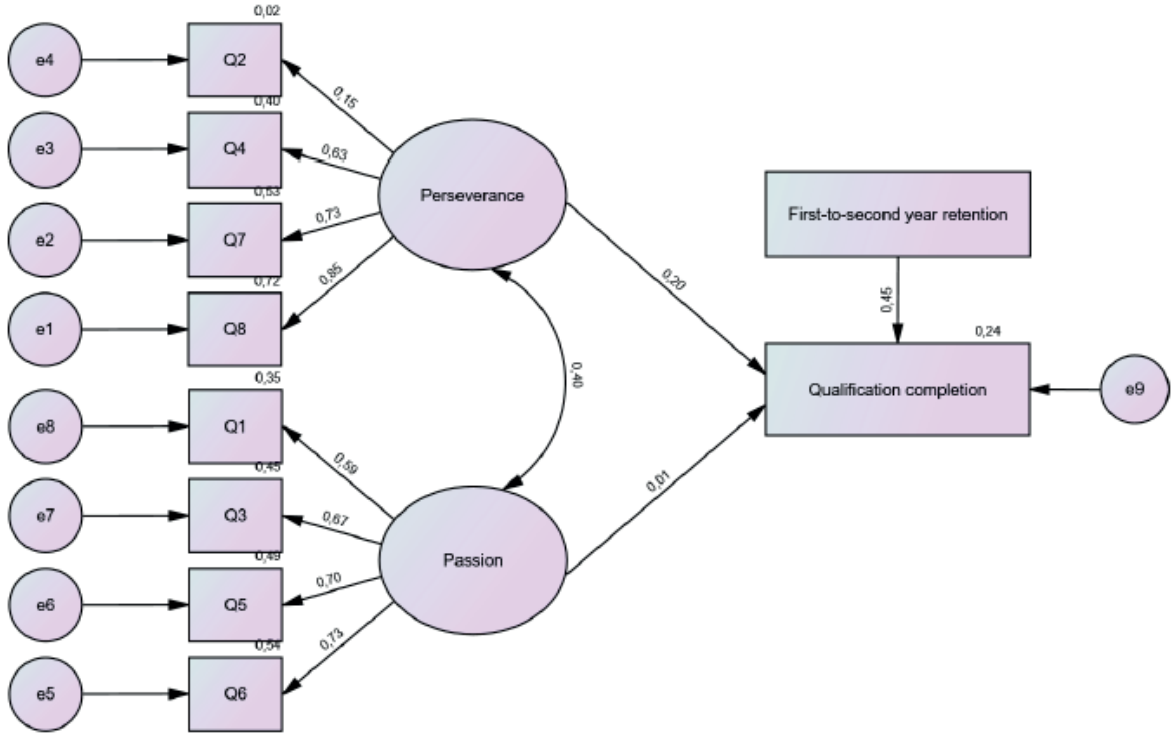

Figure 2. Structural equation model of grit, first-to-second year retention and student success (Third model)

Supplementary analyses were conducted to calculate the odds ratios (*OR*) of the significant paths identified above. In order to calculate *OR*s and considering the binary nature of the dependent variable (i.e. completed or not completed), a binary logistic regression was performed (both indicators were forced into the first block).. Results from the regression analysis revealed that both perseverance and retention (from first to second year) were significant predictors of qualification completion and produced respective *OR*s of 1.98 (95% CI: 1.45 - 2.69) and 12.15 (95% CI: 7.40 – 19.95). See Table 6 below for the regression coefficients, Wald statistics and the *p*-values.

Table 6. Variables in the equation

	B	S.E.	Wald	*df*	p-value	Exp(B)	95% C.I. for Exp(*B*)	
							Lower	Upper
First-to-second year retention	2.497	.253	97.443	1	< .001	12.151	7.400	19.950
Perseverance	0.681	.158	18.585	1	< .001	1.976	1.450	2.692
Constant	-3.700	.696	28.237	1	< .001	.025		

Sensitivity Analysis

Following the adoption of the third model, a sensitivity analysis was conducted to assess the impact of different specifications on the model. In particular, high- and low categories were established in the perseverance and passion domains using their respective medians (4.25 and 3.75). Although the model fit indices are similar to those reported above, the proportion of variance explained (in qualification completion rates) by each derivative of this model varies substantially (from 17% to 34%). These results are tabulated beneath.

Table 7. Sensitivity analysis: Model fit indices

Model derivative	*N*	χ^2/df	*p*	GFI	CFI	NFI	TLI	RMSEA	SRMR	r^2
Low perseverance (< 4.25)	283	1.40	.064	.968	.978	.927	.970	.038	.063	.26
High perseverance (≥ 4.25)	295	1.60	.015	.966	.949	.878	.930	.045	.057	.20
Low passion (< 3.75)	271	1.54	.025	.963	.948	.868	.929	.045	.060	.34
High passion (≥ 3.75)	307	1.06	.369	.978	.994	.915	.992	.014	.043	.17

DISCUSSION

Results from the data analysis allude to a number of pertinent points, the first of which relates to the psychometric properties of the Grit-S scale. Results from the CFA revealed that the two-factor model of grit (comprising passion and perseverance) fit the data exceptionally well (χ^2/df = 2.45, GFI = .985, CFI = .983, NFI = .972, TLI = .975, RMSEA = .04, SRMR = .03). In addition to this construct validity, the psychometric analysis also revealed that both latent constructs were soundly reliable among the honours sample, producing Cronbach's alpha coefficients above .62 and composite reliabilities above .73. Of particular relevance is the substantial gain noticed by the suggested removal of Item 2 (*Setbacks don't discourage me*), increasing Cronbach's alpha in the perseverance domain from .62 to .79. Although fairly novel in DE, these results are similar to those reported by Arco-Tirado, Fernandez-Martin and Hoyle (2018), Bowman, Hill, Denson and Bronkema (2015), Broghammer (2017), Fosnacht, Copridge and Sarraf (2018), Li (2015) and Wyszynska, Ponikiewska, Karaś, Najderska and Rogoza (2017), all of whom have noted concerns with this particular item among traditional student populations. Nonetheless, according to Nunnally and Bernstein (1994), if the composite reliability coefficient of a construct is above .70 (as is the case in the current paper), there is substantial evidence to support the reliability of the construct and thus warrant all items' inclusion.

The second pertinent point that emerged from the analyses is that psychological grit, or its two latent constructs rather, were *not* predictors of first-to-second year retention among the DE honours sample. Both path coefficients, although positive, were not significant ($p > .05$). Similar results, although scant and confined to traditional HE environments, have been reported by Broghammer (2017) and Rogalski (2018), both of whom revealed that grit was unable to significantly predict retention from one academic period to the next. For the most part, though, the results reported in the current paper differ from those commonly cited in grit literature, which reports significant relationships between retention and grit (Bowman et al., 2019; Duckworth et al., 2007; Duckworth & Quinn, 2009; Saunders-Scott et al., 2018).

Lastly, the results from the final structural model highlighted the significant influence of first-to-second year retention (β = .45) and perseverance (β = .20) on student success (operationalised at qualification completion). Both path coefficients were positive, indicating 1) that as one's perseverance increases, so too does the likelihood of completing an honours degree, and 2) retention from first to second year increases the likelihood of degree completion. Supplementary binary logistic regressions quantified these likelihoods; with an *OR* of 1.98 (95% CI: 1.45 – 2.69) calculated for perseverance and an *OR* of 12.15 (95% CI: 7.40 - 19.95) for retention. Regarding the latter, this result indicates that, when a student is retained from first to second year, the odds of completing an honours qualification are 12.15 times greater than the odds of not completing. Although substantially smaller, the *OR* for perseverance indicates that, when a student exhibits perseverance, the odds of that student completing an honours degree are 1.98 times greater than the odds of not completing. This final model explained 24.5% of the variance in qualification completion rates, with the biggest contributor being first-to-second year retention (β = .45; $p < .01$). Sensitivity analysis revealed that these path estimates and model fit indices are not sensitive to high (or low) scores on the grit domains; the proportion of variance explained (in student success rates), on the other hand, appeared sensitive to these derivatives.

Similar results have been reported by a plethora of researchers who operationalised student success using grade point averages (GPAs), academic performance, or course completion (Akos & Kretchmar, 2017; Beyhan, 2016; Broghammer, 2017; Duckworth et al., 2007; Hwang et al., 2017; Lee & Sohn, 2017; Mason, 2018; Muenks, Wigfield, Yang & O'Neal, 2017; Pate, Payakachat & Harrell, 2017; Reraki, Celik &

Saricam, 2015; Rogalski, 2018; Rojas & Tyler, 2018; Strayhorn, 2013; Terry & Peck, 2020; Wang & Baker, 2018). Collectively, these results reveal that psychological grit is significantly associated with and can predict GPA, performance and course completion in an array of tertiary settings, both contact and distance. More attuned to the current findings are those reported by Lee (2017), Wolters and Hussain (2015) and Xu, Meijs, Gijselaers, Neroni and De Groot (2020), who reveal that only the perseverance domain was significantly associated with - or could - predict student success (operationalised as academic performance, expected grades and course grades, respectively). Interestingly, passion had no influence on either of the student outcomes in this paper (i.e. retention or qualification completion), nor in those by Lee (2017) and Wolters and Hussain (2015). It did, however, correlate positively with course credits (r = 0.079) and exam attempt (r = 0.154) in the study by Xu et al. (2020).

LIMITATIONS AND IMPLICATIONS

No study is without limitation; and this study is no exception. Firstly, the non-experimental, cross-sectional design limits the ability to draw causal inferences around grit's role in determining student success among DE students in the country and does not lend itself to the exploration of these variables over extended periods of time. What's more, this study relied on self-report data which is often scrutinised for potential response-, social desirability- and acquiescence bias. And lastly, the study only sampled postgraduate students at one DE institution in South Africa; future research endeavours would benefit from the analysis of these variables among undergraduates at UNISA and other HEIs in the country.

Despite these limitations, the results have important implications for practice. Firstly, these findings suggest that cultivating or enhancing perseverance among DE students from the first or second year onwards could prove fruitful in improving ultimate qualification completion. This could take the form of including activities into support programmes aimed at developing a growth mindset, which has been linked to higher levels of grit (Hacisalihoglu, Stephens, Stephens, Johnson, & Edington, 2020; Kaya & Yuksel, 2022; Mas, Adi, & Amawidyati, 2023). First-year experience programmes are an ideal space, in the researchers' opinion, to host such activities as it would form part of the orientation to the institution and HE. The results also suggested that students who are retained from first-to-second year are 12 times more likely to complete their qualification, as such, another (practical) implication of this study is that retention strategies at DE institutions should focus their efforts on retaining students during the same two academic periods (i.e. from first year to second).

CONCLUSION

The results outlined above align with the majority of the literature which suggests that psychological grit is associated with student success in HE generally and in DE specifically, thus somewhat confirming the argument that grittier individuals are more likely to complete their tertiary studies. However, a caveat worth noting is the variance explained by the model, with grit (or the perseverance domain rather) accounting for only 4% of the variation in student success rates. Perspicuous in these findings is the bigger role played by environmental, socio-economic and institutional factors in addressing retention and academic success in a South African HE institution plagued by past inequalities. Further studies in this field should therefore seek to map the relationships between these factors (i.e. environmental, socio-economic and institutional) in relation to grit to gain a more comprehensive picture of student success in the South African DE landscape.

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